



## Early Journal Content on JSTOR, Free to Anyone in the World

This article is one of nearly 500,000 scholarly works digitized and made freely available to everyone in the world by JSTOR.

Known as the Early Journal Content, this set of works include research articles, news, letters, and other writings published in more than 200 of the oldest leading academic journals. The works date from the mid-seventeenth to the early twentieth centuries.

We encourage people to read and share the Early Journal Content openly and to tell others that this resource exists. People may post this content online or redistribute in any way for non-commercial purposes.

Read more about Early Journal Content at <http://about.jstor.org/participate-jstor/individuals/early-journal-content>.

JSTOR is a digital library of academic journals, books, and primary source objects. JSTOR helps people discover, use, and build upon a wide range of content through a powerful research and teaching platform, and preserves this content for future generations. JSTOR is part of ITHAKA, a not-for-profit organization that also includes Ithaka S+R and Portico. For more information about JSTOR, please contact [support@jstor.org](mailto:support@jstor.org).

the first had had two tusks of the largest size, whilst the second had none, or any trace of alveolus. Two lower jaws in the cabinet of the Society, of nearly the same age, (described and figured in the *Trans.* Vol. IV. Plates XXIV. and XXV.) were also destitute of tusks, or alveoli for them.

Dr. H. examined the analogies adduced by Prof. Owen in support of his theory, and expressed the opinion that they were very remote; and as the extensive knowledge of that distinguished naturalist had not furnished him with closer ones of the desired character, it was clearly presumable that none could be adduced.

A much closer analogy, Dr. H. observed, was to be found in the *Dinotherium*, a very nearly allied animal; but so far as its remains, hitherto obtained, enabled us to decipher its history, it was furnished with two tusks in the lower jaw.

On the whole, Dr. H. saw little reason to change the opinion first expressed by him (see *Trans.* Vol. IV. p. 318.) that "it is impossible in the existing state of our knowledge, and with our present materials, either to confirm or positively refute the suggestion," that the tusks in the lower jaw are a mere sexual character. The honour of establishing this point is yet to be reaped. Should the suggestion, however, prove correct, Dr. H. believed it would be found that the male had two tusks in the lower jaw, instead of one, as supposed by Prof. Owen; and that the jaw in Mr. Koch's collection, containing a single tusk, is to be considered an anomaly.

---

*Stated Meeting, May 20.*

Present, twenty-three members.

Dr. PATTERSON, Vice-President, in the Chair.

Letters were read:—

From M. Alexis de Tocqueville, dated Paris, 7th April, 1842, acknowledging the honour done him by his election as a member of this Society:—also from Dr. Locke, of Cincinnati, dated 12th May, 1842, accompanying a donation, presented through Mr. Dobson.

The following donations were announced:—

## FOR THE LIBRARY.

Quarterly Summary of the Transactions of the College of Physicians of Philadelphia. No. 2. For Feb. March and April. 8vo. Philadelphia, 1842.—*From the College.*

The American Medical Library and Intelligencer. By R. Dunglison, M.D. New Series. Vol. I. No. 10. For April. 8vo. Philadelphia, 1842.—*From the Editor.*

Report upon the Standards of the Liquid Capacity Measures, &c. &c. with Description of a New Original Barometer, and of the Balance for adjusting the Half-bushels by their Weight of Distilled Water. By F. R. Hassler. Senate Document, No. 225. 2d Session, 27th Congress.—*From the Author.*

Tabular View of the Scholastic Institutions in the Russian Empire. 4to. St. Petersburg, 1838.—*From the Imperial Academy of Sciences of St. Petersburg.*

Case, and Opinion of P. S. Du Ponceau and A. Davezac, Counsellors, on the Contested Seat of the Hon. David Levy, Delegate from Florida.—*From the Hon. David Levy.*

## FOR THE CABINET.

A Collection of Casts of Fossils, chiefly of Western Rocks.—*From Prof. John Locke.*

The Committee, consisting of Prof. Bache, Mr. Nicollet and Dr. Patterson, to whom was referred the paper of Prof. Loomis, entitled, "Observations of the Magnetic Dip in the United States, Fourth Series," reported in favour of its publication in the Transactions of the Society; and the publication was ordered accordingly.

The same Committee reported in favour of publishing in the Transactions, Professor Loomis's Supplementary Observations on the Storm which occurred about the 20th of December, 1836; and its publication was ordered accordingly.

The Committee, consisting of Mr. Walker, Dr. Patterson and Prof. Kendall, to whom was referred the paper of Mr. Nicollet, entitled, "Astronomical Observations made at various Places in the United States," recommended the same for publication in the Society's Transactions, and the recommendation was adopted.

Mr. Walker read a paper, entitled, "Observations of Encke's Comet in March and April, 1842, at the High School Observatory, with the 9 feet Fraunhofer Equatorial, by Sears C. Walker and E. Otis Kendall;" which was referred to a Committee.

The true right ascensions and declinations of the stars of comparison, on the evenings of observation, are stated in the paper as follows:

	<i>h</i>	<i>m</i>	<i>s</i>		<i>°</i>	<i>'</i>	<i>"</i>				
<i>a</i> =	1	46	11.18,	<i>a'</i> =	+	16	46	26.04,	*9	Mag.,	Bessel's Zone, No. 394.
„	1	46	11.28,	„		16	46	31.26,	9	„	Lalande H. C., p. 192.
<i>b</i> =	1	46	10.55,	<i>b'</i> =		16	41	24.72,	9	„	Bessel's Zone, No. 394.
<i>c</i> =	1	49	25.88,	<i>c'</i> =		16	46	1.69,	8	„	„ „ „
„	1	49	25.51,	„		16	46	8.32,	8.9	„	Lalande, H. C., p. 192.
<i>d</i> =	1	49	41.70,	<i>d'</i> =		16	52	32.70,	10	„	Anonym. Approx.
<i>f</i> =	2	1	4.60,	<i>f'</i> =		17	15	12.90,	10	„	„ „ „
<i>g</i> =	1	59	6.71,	<i>g'</i> =		17	16	29.60,	7.8	„	Bessel's Zone, No. 394.
„	1	59	6.51,	„		17	16	33.80,	7.8	„	„ „ „ 332.
„	1	59	6.01,	„		17	16	29.60,	7.8	„	Piazzi
<i>h</i> =	2	3	52.90,	<i>h'</i> =		17	16	51.50,	10	„	Anonym. Approx.
<i>i</i> =	2	17	18.20,	<i>i'</i> =		17	17	0.70,	9.10	„	„ „ „
<i>k</i> =	2	31	58.31,	<i>k'</i> =		15	0	18.69,	8.9	„	Bessel's Zone, No. 394.
„	2	31	58.10,	„		15	0	20.83,	8.9	„	„ „ „ 141.
<i>l</i> =	2	32	46.87,	<i>l'</i> =		14	57	48.28,	9	„	„ „ „ 141.
„	2	32	47.35,	„		14	57	51.90,	9	„	„ „ „ 32.

The measures and transits observed with the Filarmicrometer were reduced by the formulæ of Bessel in the Astr. Nachr. No. 69, and in the Königsberg Observations, Vol. XV. p. 22. Those of the same star were referred to a common epoch, by means of Encke's Ephemeris. The probable errors were computed in the usual manner. The true places of the comet in right ascension and declination, were obtained free from aberration, parallax and refraction.

Date.	Sidereal time at Philadelphia. $\mu$	Comet's place freed from Aberration, Parallax, and Refraction.		No. of single results.
		$\alpha$ = Comet's true R. A.	$\delta$ = Comet's true dec.	
1842.	<i>h m s</i>	<i>m s</i>		
March 27	7 54 57	<i>a</i> + 0 18.358 $\pm$ 0.06	<i>a'</i> - 1' 29.38 $\pm$ 1.9	3
„ 27	7 59 21	<i>b</i> + 0 20.404 $\pm$ 0.60	<i>b'</i> + 3 29.28 $\pm$ 2.3	3
„ 28	7 37 55	<i>c</i> + 0 39.279 $\pm$ 0.16	<i>c'</i> + 7 43.22 $\pm$ 2.1	5
„ 28	7 50 54	<i>d</i> + 0 22.790 $\pm$ 0.03	<i>d'</i> + 1 20.91 $\pm$ 0.3	2
„ 31	7 54 35	<i>f</i> - 0 7.860 $\pm$ 0.12	<i>f'</i> - 1 46.13 $\pm$ 1.6	4
„ 31	8 36 34	<i>g</i> + 1 56.222 $\pm$ 0.65		3
April 1	7 50 51	<i>h</i> + 0 38.149 $\pm$ 0.34	<i>h'</i> - 0 8.51 $\pm$ 0.4	3
„ 5	8 42 12	<i>i</i> + 0 45.608	<i>i</i> - 11 26.31	1
„ 11	8 53 36	<i>k</i> - 1 41.525 $\pm$ 0.19		4
„ 11	8 54 1	<i>l</i> - 2 29.715 $\pm$ 0.28		4

By applying the places of the known stars in the above collection, the final results are found as follows :

Date.	Sidereal time at Philadelphia. $\mu$	Comet's true R. A. and Dec. from Observation.		Correction of Encke's Ephemeris.		No. of results.	Authority for Star's Place.
		$\alpha$	$\delta$	$\cos \delta \Delta \alpha$	$\Delta \delta$		
1842.	<i>h m s</i>	<i>h m s</i>		<i>s.</i>			
Mar. 27	7 54 57	1 46 29.54	+16 44 56.7	+ 0.57	+ 5.4	3	Bessel's Zones.
" 27		1 46 29.64	+16 45 1.9	+ 0.67	+10.6	3	Lalande H. C.
" 27	7 59 21	1 46 30.95	+16 44 54.0	+ 1.30	+ 0.9	3	Bessel's Zones.
" 28	7 37 55	1 50 5.16	+16 53 44.9	+ 2.75	+ 2.6	5	"
" 28		1 50 4.79	+16 53 51.5	+ 2.40	+ 9.3	5	Lalande H. C.
" 31	8 36 34	2 1 2.83		+ 0.33		3	Bessel's Zones.
" 31		2 1 2.23		- 0.24		3	Piazzi.
April 11	8 53 36	2 30 16.67		- 1.85		4	Bessel's Zones.
" 11	8 54 1	2 30 17.40		- 1.16		4	" "
Mean of 33 results, $\cos \delta \Delta \alpha = + 0s.65 \pm 0s.32$ .							
" 19 " $\Delta \delta = + 5''.8 \pm 1''.2$ .							

Dr. Hare laid before the Society various specimens of fused iridium, osmiuret of iridium, and of rhodium.

The largest mass of iridium weighed sixty-seven grains; that of rhodium ninety grains. The former leaned towards the pale brilliant white of antimony, the latter towards the ruddy hue of bismuth. Both metals had a pre-eminent disposition to crystallize. The rhodium, in congealing from the state of a globule as fluid as mercury, became studded all over its surface with crystalline facets, excepting the portion in contact with the support. A portion of the interior of a globule of iridium ran out during congelation, coating the outside partially with crystalline facets. This excessive propensity to crystallize rendered it difficult to obtain regular globules of this metal. This propensity was displayed in a higher degree by the native osmiuret. Dr. Hare suggested that the greater difficulty of fusing this alloy might be ascribed to the infusibility of osmium, which might resemble carbon in forming a volatile oxide, and in being infusible per se.

Dr. Hare made some remarks respecting the cause of the persistence of clouds between certain elevated levels.

He said that, in the last number of the Society's "Proceedings," a brief mention had been made of some observations and an explana-

tion advanced by him respecting the suspension of clouds. He had, however, to regret that the most essential parts of his communication had not been reported. With the permission of the Society, he would recapitulate his communication, in order that the readers of the "Proceedings," and members who were not present when he spoke on the subject in question, might not have an erroneous impression. He would also add some suggestions which had recently occurred to him.

It is well known that, although there were occasionally two different sets of clouds pertaining severally to different currents of air, one above the other,—usually, in fair weather, there was but one set. In either case all the clouds belonging to one current are seen to be situated somewhere between two levels. Above the space, included between these levels, none are seen to rise; nor are any observed to sink below its lower boundary. It was conceived that the causes of this persistence of the clouds between two horizontal planes, of which the lower one is usually more than a mile in height, had never been satisfactorily assigned.

Agreeably to the prevalent impression that clouds are enduring masses of condensed aqueous vapour, their specific gravity ought to be much greater than that of the subjacent cloudless air, over which they swim; since the little watery bubbles of which they are formed, consist, not only of the air with which they are inflated, but also of a liquid 840 times as heavy. But he had of late years observed that clouds are not as durable as generally supposed. On the contrary, like the steam condensed in escaping from boiling water, they are incessantly forming by the condensation of aqueous vapour, and disappearing in consequence of its being vaporized again. A cloud may appear to cling to the brow of a mountain, sometimes for more than an hour; when, on closer examination, it may be discovered that, as one portion appears, another vanishes, and that the apparent durability is due to the equality of the causes of condensation and re-vaporization. Dr. Hare had enjoyed a fine opportunity of verifying this view of the subject, when involved within a cloud on the summit of the Rhigi, last summer. It was then quite evident, that what might, at a distance, be mistaken for an enduring mass of condensed moisture, such as is called a cloud, was really due to a current of air, saturated with aqueous vapour, which was rushing up the mountain side. As this current reached a level, at which the temperature was below its dew point, the contained vapour was converted by condensation into a cloud; but as it attained a higher level, where the dew point was sufficiently low to compensate for the cold, the moisture was made to resume the aëriform state.

As in condensing, steam relinquishes as much heat as would make it red-hot, if retained while under sufficient pressure to keep it in the liquid state, it follows that, as the cloud is formed, the temperature of the air with which it is associated is raised so much as to produce a buoyancy which enables it to float or even to ascend;\* but as soon as it reaches a point where the air is so devoid of aqueous vapour as to permit it to be revaporized, a proportionable refrigeration and increase of density ensues. Thus the buoyancy produced at one level, is compensated by a commensurate opposite influence at another. Of course, the clouds are always seen to occupy an interval between two horizontal planes, one above the other. As soon as the aqueous vapour of the air rises above the lower plane it condenses; before the cloud thus produced can get beyond the upper one it is reconverted into vapour.

When the causes of condensation are more potent than those of re-vaporization, rain ensues; when the opposite is the case, there must be a tendency to fair weather.

Although of opinion that in hurricanes and other violent rain storms, there must be an exchange of position between the lower and upper strata of the air, it was conceived that showers, unaccompanied by gales or squalls, were to be explained as above suggested.

Dr. Hare had conceded that there might be more than one cause for the buoyancy of clouds. Dr. Thomson, in his treatise respecting Heat and Electricity, suggests electricity as a cause. The fact demonstrated by the experiment, the results of which had been communicated to the Society at their last meeting in April, that moisture does not render air a conductor of electricity, gives support to this view of the subject; especially since it has been discovered, that in condensing, steam becomes highly electrified. It seems inevitable that the aqueous globules, of which clouds are constituted, must separate from each other, as pith balls are seen to do when similarly excited; and that the particles of air with which they are associated must be similarly actuated: hence a cause of rarefaction, and of course of buoyancy. Another cause might co-operate. It is known that the radiation of heat, which causes dew and sometimes hoarfrost, is so completely checked by clouds, that the last mentioned phenomenon never takes place when the sky is overcast. Moreover, it is known that the solar rays pass through the air without imparting heat,

\* See a verbal communication of Dr. Hare, made July 3d, 1840, and published in the "Proceedings" for that time.

until intercepted by solids or liquids. It follows that the air in which clouds are situated, will be warmer than that above and below them.

Thus radiant heat and electricity may promote their buoyancy; nevertheless their persistency between two levels must be ascribed to the process noticed on the summit of the Rhigi.

Mr. Espy had the merit of drawing the attention of meteorologists more strongly to the fact, *previously made known by Dalton*,\* that, although cold is produced by the rarefaction of air containing vapour, yet the reduction of temperature is less, whenever the vapour is condensed, than it would have been in air free from vapour.

In adopting the explanation above given, Dr. Hare had been prompted by his knowledge of Mr. Espy's suggestions founded on those of Dalton, so far as a superior temperature had been ascribed to the air containing a recent cloud.

Mr. Boyè made an oral communication relative to a white crystalline mineral, which occurs three or four miles to the south of West Chester, Pa., and which encloses corundum and several other mineral species.

The specimen was handed to him for examination by Mr. Nuttall, several years since, and, proving to be a silicate closely allied to a felspar, he subjected it to analysis, in conjunction with Prof. Booth, in order to compare it with the several felspars previously investigated by them.

It forms a white translucent mass composed of densely aggregated crystalline grains, and might be mistaken, at the first glance, for a moderately coarse-grained marble, did not its hardness indicate a totally different substance. Its specific gravity is 2.612.

The analysis was performed in the manner mentioned in the Proceedings of the Society for May, 1841, and gave the following results:

		Oxygen.	
Silica, . . . . .	67.72	35.18	
Alumina, with a trace of iron, . . . . .	20.54	9.593	
Magnesia, . . . . .	0.34	0.131	} 3.101 } 12.69
Lime, . . . . .	0.78	0.219	
Soda, . . . . .	10.65	2.724	
Potassa, . . . . .	0.16	0.027	
	<hr/> 100.19 <hr/>		

\* See Nicholson's Journal, vol. iii. p. 160, or Manchester Memoirs, vol. v. p. 515.

This composition approaches nearest to that of albite, excepting in a deficiency of silica, in which respect it resembles the albite from the vicinity of Wilmington, otherwise corresponding to it closely in composition, and agrees also with an albitic feldspar from Pennsylvania, analyzed by Redtenbacher, in Prof. Rose's laboratory at Berlin, (Poggendorff's *Annalen*, Vol. LII. p. 469,) as shown by the following comparative table.

ALBITE.	Six miles N. W. of Wilmington, Del. <i>Booth &amp; Boyd.</i>	Pennsylvania. Locality not stated. <i>Redtenbacher.</i>	Granular Var'y. West Chester, Pa. <i>Booth &amp; Boyd.</i>
Silica, . . .	65.46	67.20	67.72
Alumina, . . .	20.74	19.64*	20.54
Sesquioxide of iron,	0.54	—	a trace.
Magnesia, . . .	0.74	0.31	0.34
Lime, . . .	0.71	1.44	0.78
Soda, . . .	9.98	9.91	10.65
Potassa, . . .	1.80	1.57	0.16
	<hr/> 99.97 <hr/>	<hr/> 100.07 <hr/>	<hr/> 100.19 <hr/>

On motion of Dr. Hays, it was resolved that a set of casts of fossil remains, made at the expense of the Society, be presented to Prof. Kaup, for the Museum of Darmstadt.

On motion of Mr. Booth, it was resolved, that the Curators have authority to permit Dr. Locke, of Cincinnati, to take casts from such specimens of fossils, as in their judgment may not be injured thereby, provided that the moulds be left with the Society and become their property.

---

*Stated Meeting, June 17.*

Present, twenty-nine members.

Dr. CHAPMAN, Vice-President, in the Chair.

Letters were read:—

From E. D. Ingraham, Esq., dated 10th June, 1842, asking permission to make a transcript of Mr. Breck's unpublished memoir on the Continental Money of the United States, now in the Society's Archives:—

From the Secretary of the Committee of Physics of the

\* Redtenbacher states that the alumina contained titanio acid.